

REMARKS

Applicant requests entry of the above-identified amendments which conform the claims and the specification to U.S. practice. No new matter is being introduced by this Amendment as antecedent support is set forth in the specification and the original claims.

Prosecution on the merits is respectfully requested.

The Examiner is invited to contact Applicant's Attorneys directly at the below-listed telephone number regarding this preliminary amendment or otherwise with respect to the present application.

If there are any charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant's attorneys.

Respectfully submitted,

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Version with Markings to Show Changes Made

IN THE SPECIFICATION

The second paragraph on page 1 is amended as follows:

“The invention relates to an injection molding machine and, more particularly, to an injection molding machine for processing plastics materials and other plasticisable compounds[, wherein] including at least partially electrically operated driving units [are used] to operate [said] the machine[, in accordance with the preamble of claim 1].”

The third paragraph on page 1 is amended as follows:

“A linear motor, which is used as the driving unit and is provided with a rotor and stator, is known for plastics material molding machines from DE-T2 37 82 817, which [forms the basis for the preamble of claim 1 and] corresponds to EP 0 280 743 B1, and JP-A 63-1516, [said] rotor and stator having cylindrical surfaces which are in operative connection with one another. These surfaces permit the magnetic face, which is needed for the required advancing forces, to be suitably incorporated in the drive axis. If [the] stator windings are symmetrically disposed in accordance with DE-A 44 45 283, the relatively high bearing forces caused by the magnetism are mutually excluded. However, even there, mention is constantly made in the description of only one primary part and one secondary part, which parts co-operate accordingly with one another. If Figure 3 there is additionally considered, it becomes apparent that the internally situated pipe is merely a carrier pipe which, just like the externally situated pipe, is neither a stator nor a rotor. When such a linear motor is used, there is a simultaneous saving in the complex converting means, which are susceptible to wear and serve to convert a rotary movement into a linear movement, such as, for example, a transmission mechanism, a spindle, levers and toothed rods (cf. also EP-A 744 815), but the forces, which are required for a plastics material injection molding machine, cannot yet be applied therefore to a sufficient extent.”

The third and fourth paragraphs on page 2 are amended as follows:

“[Based on this prior art it is the object of t]The present invention [to] provides a linear motor for an injection molding machine, which motor can also apply the advancing forces required for an injection molding machine.

[This object is achieved by a]An injection molding machine [having the features of claim 1] for processing plastics materials and plasticisable materials of the present invention includes an injection molding unit and a mould closing unit, which are operated at least partially by an electric driving unit including at least one linear motor, which has a rotor with magnets, disposed along a first cylindrical surface, and a stator with stator windings disposed along a second cylindrical surface, the first and second cylindrical surfaces of stator and rotor being concentrically disposed, and the stator windings being substantially symmetrical relative to an axis of movement of the linear motor.
Additionally, a plurality of identically acting first surfaces are stacked with a corresponding number of identically acting second surfaces, the first and/or second surfaces each being operable jointly in operative connection.”

The second paragraph on page 3 is amended as follows:

“[According to claim 7,] [c]Cooling ducts may be disposed in the cylindrical walls of the stator, so that the heating, caused by the current, can be reliably dissipated. The cooling medium used therefor can, at the same time, be used to control the temperature of other component parts in the injection molding machine.

IN THE CLAIMS

Claims 1-11 are amended as follows:

1. (Amended/Marked up) Injection molding machine for processing plastics materials and [other] plasticisable [compounds] materials, [having] comprising: an injection molding unit [(S)] and a mould closing unit [(F)], which [units] are operated at least partially by an electric driving unit[s in the form of] including at least one linear

motor, which has a rotor with magnets [(25)], disposed along a first cylindrical surface [(11)], and a stator with stator windings [(26)] disposed along a[n] [additional] second cylindrical surface [(12)], the first and second cylindrical surfaces [(11,12) of stator and rotor] being concentrically disposed, and the stator windings [(26)] being substantially symmetrical relative to [the] an axis of movement [(a-a)] of the linear motor, [characterized in that] wherein a plurality of identically acting first surfaces [(11)] are stacked with a corresponding number of identically acting [additional] second surfaces [(12)], at least one of the first and[or additional] second surfaces [each] being operable jointly in operative connection.

2. (Amended/Marked up) Injection molding machine according to claim 1, [characterized in that] wherein the magnets are [magnets or] separately excited coils with an iron core.

3. (Amended/Marked up) Injection molding machine according to claim 1, [characterized in that] wherein the electric driving unit is a regulated servo driving unit.

4. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 3], [characterized in that] wherein the identically acting first [or respectively additional] or second surfaces are [the] an outside and inside of a first cylinder [(60)], and [in that] wherein the identically acting [additional or respectively] first or second surfaces are so disposed on [two] concentric second and third cylinders [(70,71)] that [the] an internal surface of the [external] second cylinder [(70)] cooperates with the outside of the first cylinder, and [the] an external surface of the [internal] third cylinder [(71)] co-operates with the inside of the first cylinder [(60)].

5. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 4], [characterized in that] wherein the linear motor is cylindrical and is overlapped on the outside by a[n additional] cylinder [(17)], which guides [the]

faces of the rotor and the stator, which are moved towards one another, along a separate bearing face [(19)] by means of at least one mounting [(18)].

6. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 5], [characterized in that] wherein the stator windings [(26)] are divided along the axis of movement [(a-a)] into a plurality of separate electrical switching zones.

7. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 6], [characterized in that] further comprising cooling ducts [(27)], which lie behind or adjacent the stator windings [(26) when viewed from the magnets (25)], are associated with said stator windings, [which] wherein a temperature of the cooling ducts [have their temperature] is controlled by means of a cooling medium.

8. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 7], [characterized in that] wherein the electric driving unit is [at least one of the following assemblies of the injection molding machine:

-] a closing mechanism for moving [the] a movable mould carrier [(13)] towards [the] a stationary mould carrier [(14)] and away from said stationary carrier and for applying [the] a closing force [if necessary,

- arrangement for applying the closing force,
- driving unit for fitting the nozzle (21) onto the injection mould (M),
- injection means for axially moving the feeding means(15),
- ejector unit (16),
- core pulling unit (K) on the injection mould (M),
- driving unit for a closure nozzle (V)].

9. (Amended/Marked up) Injection molding machine according to [one of] claim[s 1 to 8] 4, [characterized in that] wherein the linear motor is employed as

[the] a closing mechanism, and [in that] wherein there is a space in [the] an interior of the third [internal] cylinder [(71)] to accommodate an ejector unit [(16)].

10. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 9], [characterized in that] wherein the linear motor is employed as [the] an injection means [(E)], [the] a covering of the cylindrical surfaces [(11,12),] increasing during displacement of [the] a feeding means [(15)] to [the] an injection mould [(M)].

11. (Amended/Marked up) Injection molding machine according to [one of] claim[s] 1 [to 10], [characterized in that] wherein the linear motor is employed as [the] a closing mechanism, [the] a covering of the cylindrical surfaces [(11,12)] increasing as [the] parts of [the] an injection mould [(M)] approach one another.